

II.—*On the Species of Thelyphonus inhabiting Continental India, Burma, and the Malay Peninsula.*—By EUGENE W. OATES, F. Z. S. Communicated by THE SUPERINTENDENT OF THE INDIAN MUSEUM.

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(With Plate II.)

The obscure animals which belong to this genus are very little known. I have steadily collected them for some years now with the best results, and not long since I took the opportunity of studying the specimens contained in the Indian Museum, all of which were very kindly placed at my disposal by Mr. J. Wood-Mason, the Superintendent of the museum.

There are now thirteen species known within the above limits, of which three have been already described, eight are new to science, and two are unknown to me, and in my opinion insufficiently described to be ever determinable. These two were described by Mr. A. G. Butler many years ago and in terms which, when applied to these animals, are altogether insufficient. For this reason I have excluded them from this paper, and I hope to notice them on a future occasion, when I have had time to examine the types, which I understand are in the British Museum. These two species are *T. sepiaris*, described from Tonghoo and Ceylon, and *T. nigrescens*, from Tenasserim (Cist. Ent. vi, p. 129).

The *Thelyphoni* live under timber and stones, lying concealed during the day time and creeping about at night only. When discovered, they seem overcome with surprise, but they speedily recover and hurry away with considerable speed into holes and crevices. They are frequently found at the roots of trees under accumulations of dead leaves and rubbish. They require moisture, but must have well drained soil.

I have never found two species together, and my experience is that each species inhabits a tract of country to the exclusion of others. For instance, in Rangoon *T. rangunensis* is found; proceeding 80 miles north, this species ceases and *T. sylvaticus* occurs. Similarly, further north *T. saxatilis* is alone found to occur. Reef and Double Islands each has its peculiar species. The species which so far as I know has the largest area of distribution is *T. indicus*, but the localities "Western Bengal and Southern India" attached to the few specimens I have been able to examine are so vague that no certainty can be attached to this point.

The *Thelyphoni*, when once you get into the way of finding them, are sufficiently abundant. I have frequently found twenty in one morning,

and, on one occasion, while visiting the lighthouse on Double Island, I secured 360 in three hours' work, myself and one man.

All the species I have met with emit a peculiar odour, more like aromatic vinegar than anything else I know, but more pungent. This odour emanates from a liquid which is ejected from an orifice near the root of the tail, and so powerful is it that it has frequently betrayed to me the position of the animal. On one occasion, when examining a live animal, I had a drop of the liquid injected into my eye, but it proved to be harmless.

These animals, it is hardly necessary to state, are quite incapable of inflicting injury to anything large than an insect. They have no sting and their cheliceres are very weak. A writer in the "Scientific American" sometime ago graphically described how a species common in Florida was in the habit of killing horses, so powerful was its sting. This is of course all nonsense.

I have not been able to discover anything regarding the breeding of these whip-scorpions. I have taken the very young only a-quarter of an inch in length and also what appeared to be pregnant females, but I could find neither eggs nor embryos in them. Mr. Fea, the energetic Italian naturalist now working in Burma, informs me, however, that he once discovered a female carrying a bunch of egg under her cephalothorax by the aid of her first pair of legs. This is all I know about the matter.

The two sexes of the *Thelyphoni* grow up absolutely alike till full grown. At this stage, the male, by some process upon which I am able, I am sorry to say, to throw no light, undergoes a transformation and emerges from it totally different from the female. That this is fact can admit of no doubt. Adult males are nearly as abundant as adult females, but half or three-quarter grown males with the external characters of the adult male, or with any characters at all not possessed by the female, are unknown. Once adult the sexes are as different as possible in appearance.

The immature animals resemble the adult female in all characters except colour, and in this latter respect the differences are not great, reds being replaced by olive-yellows or greens and black tints by pink ones.

In growing up, they seem to undergo numerous moults just like the scorpions and spiders.

The adult sexes are markedly different in all the species I know. The more marked difference is in the size and armature of the cheliceres, but there are minor differences, such as the grooving or entirety of the first lower abdominal segment, the size of the abdomen, and the colour of the cheliceres.

Adults of both sexes may be recognized by a certain redness and tumidity of the first lower abdominal segments not apparent in the immature animal.

I append a key to the eleven species known to me, and, in the plate, I have figured some parts of certain animals which will be of great assistance in the discrimination of the species.

In my descriptions I have only dwelt upon those characters which are of importance, chiefly the details of the cheliceres, the colours, and the important points of the cephalothorax and abdomen. I have not found the legs to vary in any appreciable degree in the different species, and therefore I have omitted them.

It will be noticed in the key that the females of some species cannot be discriminated from each other. I do not mean by this that the females are absolutely alike, but merely to express my inability to diagnose them in intelligible brief terms. Compared with each other they are sufficiently distinct, varying in shade of colour, shape of cheliceres, and in other points.

There are many immature specimens in the Indian Museum which I have hesitated to describe till mature animals are available. It is to be feared that many of the descriptions of these animals are based on young specimens, and, if so, they are useless, as the young of many species (which, when adult, are perfectly distinct) are absolutely alike.

On examining the specimens which the late Dr. Stoliczka referred to *T. angustus*, Lucas (J. A. S. B. 1873, pt. ii, p. 134), I found that the specimens were referable to the young of *T. assamensis*, *T. formosus*, and a species from Penang, the adult of which is unknown.

Key to the Species.

- a. With a sharp ridge between the central and lateral eyes.
 - a'. First joint of cheliceres with a lateral spine as well as a terminal one.
 - a''. Apophysis of the fourth joint of the cheliceres cylindrical, smooth on both edges, the outer edge rounded off at the tip (Fig. 13), *assamensis*, ♂.
 - b''. Apophysis of the fourth joint of the cheliceres sharply triangular, serrated on both edges, *assamensis*, ♀.
 - b'. First joint of cheliceres with only a terminal spine; second joint generally with 6 teeth.

- c''*. First lower abdominal segment divided longitudinally by a groove (Fig. 3 and 4).
- a'''*. Groove very deep and distinct (Fig. 3).
- a⁴*. Moveable finger of cheliceres festooned interiorly (Fig. 5); the terminal joint of the cheliceres of large size, broader than the fourth joint, *indicus*, ♂.
- b⁴*. Moveable finger of cheliceres simply rounded interiorly (Fig. 11); the terminal joint of the cheliceres weak, much narrower than the fourth, *johorensis*, ♂.
- b'''*. Groove very shallow and indistinct (Fig. 4), *indicus*, ♀.
- d''*. First lower abdominal segment entire, with no trace of a groove, *johorensis*, ♀.
- b*. With no sharp ridge between the central and lateral eyes, this region being rounded.
- c'*. Apophysis of fourth joint of cheliceres long and cylindrical, smooth on both edges, suddenly and quadrately widened out on the terminal quarter of its length (Fig. 12), *andersoni*, ♂.
- d'*. Apophysis of fourth joint of cheliceres cylindrical, smooth on both edges, suddenly narrowed on the terminal half of its length (Fig. 10), *wood-masoni*, ♂.
- e'*. Apophysis of fourth joint of cheliceres absolutely cylindrical, the two edges being parallel throughout their length and smooth (Fig. 7).
- e''*. Length of abdomen and cephalothorax 1.3 inch, *insularis*, ♂.
- f''*. Length of abdomen and cephalothorax 1 inch, *formosus*, ♂.
- j'*. Apophysis of fourth joint of cheliceres approximately cylindrical but the edges more or less swollen towards their extremities (Fig. 9).
- g''*. Inner edge of the fourth joint of the cheliceres coarsely granulated; the inner edge of the third joint double the length of the front edge of the second, *binghami*, ♂.
- h''*. Inner edge of the fourth joint of the cheliceres smooth; inner edge of third joint equal to the front edge of the second.
- c'''*. The three hinder pairs of legs uniformly red, *saxatilis*, ♂.

large apophysis on the interior-front corner, long and cylindrical, terminated with a large spine and furnished below with numerous teeth like a coarse file (Fig. 13); fifth joint much narrower than the fourth, fixed finger short and triangular almost smooth on both edges, movable finger long and curved, serrated below, in shape much as in Fig. 11; one sharp spine on the lower projecting angle of the joint; first joint of cheliceres below densely punctured and slightly wrinkled in places; the anterior process with a lateral spine as well as a terminal one; cephalothorax densely granulated all over with a very pronounced sharp ridge between the lateral and middle eyes.

First lower abdominal segment wrinkled in the middle, not divided by a groove; posterior edge well rounded.

Structure ♀. Cheliceres as densely granulated as in the male; second joint with five very distinct teeth in front and two spines below; third joint with a blunt spine on the interior edge and a long, sharp one below; fourth joint with a minute spine below and a triangular, pointed apophysis on the interior-front corner serrated on both edges (Fig. 8); fifth joint very narrow and feeble, fixed finger short and sharply triangular, serrated on both edges, movable finger long and sharply pointed, curved (Fig. 6), serrated on the inner edge; first joint of cheliceres below as in the male.

Cephalothorax as in the male. First abdominal segment below differing in no respect from that of the male.

Found throughout Assam and Sikkim, and the hill-ranges of Eastern Beugal and Cachar.

The late Dr. Stoliczka appears to have been ignorant of the great difference of structure between the sexes of these animals, and he describes the two sexes under different names. His name has priority over Mr. Butler's by four years. This species is widely distributed and appears to be common, and was consequently, we may suspect, known to the earlier writers on these animals, but to identify it with any of their names is now impossible. It will be well, therefore, to adopt Dr. Stoliczka's name instead of making fruitless attempts to find an earlier one.

2. *THELYPHONUS INDICUS*. Pl. II, Figs. 1—6.

Thelyphonus indicus, Stoliczka, J. A. S. B. 1873, pt. ii, p. 138, pl. xii, fig. 5.

„ *boddomei*, „ J. A. S. B. 1873, pt. ii, p. 142, pl. xii, fig. 6.

♂. Cephalothorax and abdomen dull chestnut-brown; cheliceres bright chestnut; legs and tail deep red below, cheliceres deep chestnut; abdomen, sternum, and legs bright chestnut. Length 1·3 inches.

♀. Similar to the male in colour.

Structure, ♂. Cheliceres strong; basal joint slightly punctured and wrinkled towards the front; second joint densely and coarsely granulated, the anterior portion rounded, with five or more sharp distinct teeth on the edge and two stronger ones on the lower surface; third joint thickly punctured all over and wrinkled towards the interior edge, which is angular and furnished with one spine, another spine below; fourth joint sparingly punctured all over and slightly granulated towards the origin of the apophysis which is triangular (Fig. 1) and slightly curved backwards, closely serrated on the outer edge and furnished with a few blunt spines on the inner; fifth joint large, broader than the fourth, sparingly punctured all over, fixed finger triangular, short and broad, finely serrated on the outer edge, the inner edge rough and furnished with a few small spines; movable finger slightly curved, the upper edge sinuated, finely serrated and with a blunt tooth near the tip (Fig. 5), the lower edge simply curved and roughly serrated.

Cephalothorax densely granulated with a sharp sinuated ridge between the lateral and central eyes.

First lower abdominal segment of huge size, tumid, divided longitudinally by a groove and broadly rounded posteriorly (Fig. 3).

Structure, ♀. The abdomen much larger and the cheliceres shorter and slighter; the apophysis of the fourth joint of the cheliceres is also much broader at the base, but of about the same length, and consequently much blunter; the first abdominal lower segment is pointed posteriorly and barely grooved (Fig. 4). The movable finger is also of a very different shape and size (Fig. 6).

An examination of the late Dr. Stoliezka's types and of some other specimens more recently acquired by the Indian Museum demonstrates that his *T. indicus* is the male and *T. beddomei* the female of the same species.

The number of teeth on the front edge of the second joint of the cheliceres varies much in this species as may be seen from the following enumeration of examples examined.

- ♂. 7 teeth on right; 5 on left with traces of 3 more.
- ♂. 6 on right one being bifid; 5 on left with trace of another.
- ♂. 6 on right; 5 on left.
- ♂. 6 on right; 5 on left.
- ♀. 7 teeth on each side (*T. beddomei*).

All the specimens I have examined came from Southern India and Western Bengal, but no precise locality is attached to them.

Mr. Butler identifies his *T. sepiaris* with this species (Ann. & Mag. Nat. Hist. ser. 4, vol. xii, p. 116), but as he gives *T. sepiaris* from Tonghoo and Ceylon, and allows *T. beddomei* to be a good distinct species,

I fear the matter is too involved for me to arrive at any conclusion on the subject without the examination of his type, and for this I have had no opportunities.

3. *THELYPHONUS JOHORENSIS*, n. sp., Pl. II, Fig. 11, ♂.

♂. Cheliceres very deep red; cephalothorax nearly black; abdomen deep red; legs deep madder, brighter towards the extremities; below, first joint of cheliceres deep red; abdomen, sternum and exinguinal joints of legs blood red. Length 1.2 inches; cheliceres .5 inch.

♀. Similar in colour to the male; slightly smaller.

Immature animal. Cephalothorax and abdomen red, legs brighter, cheliceres bright coral-red.

Structure, ♂. First joint of cheliceres densely punctured all over; second densely punctured, with six teeth on the anterior and lateral edges and two strong spines below; third densely punctured all over, with a very strong spine below; fourth joint densely punctured, with a long recurved triangular apophysis, serrated on the outer edge, and with a few teeth on the outer; fifth joint (Fig. 11) weak, narrower than the fourth, sparingly punctured, fixed finger serrated on the outer edge, with a few spines on the outer and down the side of the joint; movable finger weak, serrated on the inner edge, with a few spines on the lower edge.

Cephalothorax densely granulated all over, the space between the central and lateral eyes ridged.

First lower abdominal segment deeply grooved longitudinally (Fig. 3), extremely swollen large and rounded.

Structure, ♀. Similar to the male, but the apophysis of the fourth joint of the cheliceres shorter and broader at base; first lower abdominal segment without a longitudinal groove, and pointed posteriorly.

I have much pleasure in naming this species after the territory of the Sultan of Johore, where Mr. Wood-Mason discovered it.

4. *THELYPHONUS ANDERSONI*, n. sp., Pl. II, Fig. 12.

♂. Cephalothorax and cheliceres dark red, the legs paler red, the abdomen of intermediate colour; below, cheliceres dark red; abdomen, sternum and exinguinal joints of legs pale red; tail rather paler than the legs. Length 1 inch.

♀. Similar in colour to the male and of same size.

Immature animal. Unknown.

Structure, ♂. Cheliceres smooth with a very few minute punctures; first joint normal; second with a few obsolete teeth on the anterior and lateral edge and two strong spines below; third with a

sharp tooth on the lower surface; fourth with an indistinct spine on the lower edge and with a long apophysis on the interior angle. This apophysis is about the same length as the joint to which it is attached, perfectly cylindrical for three-quarters of the length, and suddenly widened out on the terminal quarter of its length to a width half as wide again as the cylindrical portion and terminating in a single recurved spine (Fig. 12); fifth joint feeble, narrower than the fourth, the interior edge toothed and furnished with hairs, the exterior edge of the fixed finger serrated; movable finger curved, sharply pointed, furnished with hairs and serrated below. Cephalothorax densely granulated, except on a portion between the lateral and central eyes, which is smooth and tumid but not ridged. First lower abdominal segment large, broadly sinuated behind, but not grooved.

Structure, ♀. Differs from the male in the structure of the cheliceres and first lower abdominal segment. Second joint of cheliceres with five distinct teeth, one on the middle of the anterior edge and four on the lateral, the foremost, situated at the angle of the two edges, being twice as large as the others, which are all of equal size, two small spines on the lower surface; third joint with a small tooth on the interior edge and one below; fourth joint with a short and sharply triangular apophysis, both edges serrated; fifth joint as in the male.

The first lower abdominal segment is longer and pointed posteriorly.

I have much pleasure in naming this species after Dr. John Anderson, the late Superintendent of the Indian Museum, who discovered it in Upper Burma. The male was taken in the second defile of the Irawadi river and the female on Pucepyoo mountain. Both are preserved in the Indian Museum.

The only female of this species is much mutilated, but I have described it to the best of my power. I regret, however, to have to leave it out of my key; when writing which I had not access to the specimen.

5. THELYPHONUS WOOD-MASONI, n. sp., Pl. II, Fig. 10.

♂. Cheliceres and cephalothorax pitchy-black; abdomen black tinged with red; legs blood-red; tail like the legs; below, first joint of cheliceres dark reddish-brown; legs and sternum with first abdominal segment blood-red, remainder of abdomen darker red.

♀. Similar to the male in colour.

Immature animal. Cheliceres coffee-brown, cephalothorax and abdomen dull rufous, the legs dull reddish vandyke-brown.

Length, male 1 inch; female, .95.

Structure, ♂. Cheliceres very sparingly punctured and nearly smooth all over, the exterior angle of the second joint transversely

wrinkled; second joint with 3-6 obsolete teeth on the anterior and interior edges and two blunt spines below; third joint with one spine below, the interior edge equal in length to the anterior edge of the second joint; fourth joint very broad, no spine below, with a long apophysis springing from the antero-lateral corner, the first half cylindrical and broad, the terminal half about half the thickness of the first and constricted in the middle, quadrately terminated and furnished with a small spine at the end (Fig. 10), the inside of the apophysis at the end with a large rounded process; fifth joint large, rounded, broader than the fourth joint, the inner edge scooped out to receive the rounded process on the apophysis of the fourth joint, causing the fixed finger to stand out as a cylindrical tooth serrated on both edges; movable finger moderately curved, serrated on the inner edge.

Cephalothorax densely granulated, the space between the anterior and the lateral eyes tumid.

Structure, ♀. Cheliceres with the first joint normal; second with five teeth on the anterior and lateral edges and two spines below; third joint with a lateral spine and one below; fourth with a spine below and a sharply-pointed triangular apophysis serrated on the inner edge and with 3 spines on the outer; fifth joint weak, narrower than the fourth, the fixed finger sharply triangular and serrated on both edges, the movable finger gently curved and serrated on the inner edge.

The cheliceres, as in the male, are nearly smooth, being very slightly punctured in a few places only.

Described from specimens taken on Muleyit mountain in Tenasserim and now in the Indian Museum. I have named it after Mr. J. Wood-Mason, the energetic Superintendent of the Indian Museum.

6. *THELYPHONUS INSULARIS*, n. sp., Pl. II, Figs. 7, 8.

♂. Cheliceres, cephalothorax, and abdomen deep black; legs and tail bright red; below, the first joint of cheliceres deep red, the other joints black, abdomen and legs bright red. Length 1.3 ins.; cheliceres .75 ins.

♀. Of the same colour as the male. Length 1.3, chel. .5 in.

Immature animal. Fourth and fifth joints of the cheliceres pink, second and third pinkish-brown; cephalothorax and abdomen greenish; coxal and femoral joints of legs pale greenish-brown, the remaining joints and the tail pale orange-yellow; below, first joint of cheliceres pale red, the other joints, and the legs, of the same colour as the upper surface, abdomen pale greenish-brown. With age the colours become firmer and the changes to the adult stage are very gradual. In half-grown specimens the legs are nearly uniform red and the cheliceres becoming blackish.

Structure, ♂. Second joint of cheliceres punctured all over, granulated and wrinkled at the anterior lateral corner, teeth on the interior and anterior margins indistinct, very variable in number and in all cases small and obsolete, no distinct spine below. Third joint punctured all over and coarsely granulated on the inner edge, with a spine below. Fourth joint with very few punctures, nearly smooth, apophysis long and cylindrical, terminated with two blunt teeth and with a large rounded process interiorly near the end (Fig. 7). Fifth joint very large and round, very nearly smooth, fixed finger short, triangular with a broad base, serrated on both edges, movable finger rather shorter than the fifth joint, serrated and sinuated within (Fig. 5). First joint beneath very sparingly punctured.

Cephalothorax granulated all over and transversely wrinkled behind the central eyes.

First lower abdominal segment smooth in the middle, not divided longitudinally by a groove.

Structure, ♀. The upper surface of cheliceres sparingly punctured throughout, 2nd joint with five very distinct teeth on the front and lateral edges, of which the two on the front edge are the largest, two teeth on the lower surface; third joint with a tooth on the interior edge and one below; fourth joint with a tooth below, the apophysis triangular, finely serrated on the outer edge, with two or three teeth on the inner (Fig. 8). Fifth joint narrower than the fourth, fixed finger sharply triangular, serrated on the outer edge, also on the inner edge nearly down to the bottom of the joint; movable finger shorter than fifth joint, gently curved throughout and serrated interiorly.

Cephalothorax and other parts, as in the male, except the first lower abdominal segment, which is pointed posteriorly.

This species is remarkable for the huge cheliceres of the adult male. It is common on Double Island at the entrance of the Moulmain River, to which island it appears to be confined, for on the opposite coast of the mainland *P. formosus* only is found. This island, which is crowned by a lighthouse, is very rocky, and only a few acres in extent. Some soft soil is found here and there under the rocks and under the bricks used for the staircase up to the summit of the island, and under these this animal occurs in incredible numbers.

7. THELYPHONUS FORMOSUS.

Thelyphonus formosus, Butler, Ann. and Mag. Nat. Hist. ser iv, vol. x, p. 201, pt. xiii, f. II.

„ „ Stoliczka, J. A. S. B. 1873, p. 137, pt. xii, f. 4.

♂. Cheliceres shiny-black; cephalothorax black slightly tinged

with red; abdomen reddish-brown tending to black; legs entirely dark red; lower surface dark chestnut, the first joint of the cheliceres much deeper; tail paler than the legs. Length 1 inch.

♀. Similar to the male in colour, and somewhat larger.

Immature animal. Cheliceres brownish-red turning to almost pure red at the end; cephalothorax black; abdomen olivaceous-brown: first three joints of all the legs olive-green; remainder of the legs and the whole lower surface pale reddish-yellow, darker on the first joint of the cheliceres.

Structure, ♂. Cheliceris very sparingly punctured all over, the second joint with a few wrinkles across the exterior portion, and with five more or less obsolete teeth on the anterior and interior edges; two spines on the lower surface; third joint with one spine below; fourth joint with a minute spine below and a long cylindrical apophysis on the interior-front angle, terminated below by a bifid tooth, and with a large rounded tubercle within; fifth joint large, broader than the fourth with a spine beneath, the fixed finger very short and triangular, serrated on both edges; movable finger sharp and curved (Fig. 11), finely serrated interiorly.

Cephalothorax finely granulated all over; space between lateral and frontal eyes swollen but not ridged.

First abdominal segment below smooth, not divided, broadly rounded posteriorly.

Structure, ♀. Second joint of cheliceres with five very distinct teeth on the front edge and two spines below; third joint with a spine below; third joint with a minute spine below and a short, bluntly-triangular apophysis on the interior-frontal angle, serrated interiorly and with a few teeth on the outside; fifth joint weak and narrow, the fixed finger triangular, sharply pointed and serrated on both edges, the movable finger weak, sharply curved and serrated within.

Cephalothorax as in the male.

First abdominal segment below smooth, the middle posterior portion abruptly lengthened.

Found in the neighbourhood of Moulmein in Tenasserim, where it appears to be common.

8. THELYPHONUS BINGHAMI, n. sp.

♂. Cheliceres and cephalothorax deep black; abdomen black tinged with red; legs bright red; below, first joint of cheliceres and the abdomen deep red, legs bright red.

♀. Of the same colour as the male, but the cheliceres strongly tinged with red.

Immature animal. First and second joint of cheliceres reddish-brown, the others coral-red; cephalothorax and abdomen dark brown; first three joints of all the legs olive-green, the others pale yellowish-red; below, the cephalothorax and abdomen reddish-brown.

Length 1.1 inches; cheliceres, ♀ .55; ♂ .45 inch.

Structure, ♂. Cheliceres sparingly granulated and punctured all over. Second joint with five ill-defined teeth on the front and lateral edges and two small spines below; third joint very long and cylindrical with one spine below; fourth joint long, the inner side granulated; with a blunt spine below and a long cylindrical apophysis on the anterior-lateral corner, slightly constricted in the middle and enlarged at the tip (Fig. 9) terminated with a rather sharp spine and a tumid process interiorly; fifth joint as broad as the fourth, serrated and festooned on the inner edge; fingers remarkably small, the fixed one triangular, nearly smooth on the inner edge, serrated on the outer, the movable one gently curved and serrated interiorly.

Cephalothorax minutely and densely granulated, the space between the lateral and frontal eyes barely tumid.

First lower abdominal segment entire, elevated and projecting posteriorly.

Structure, ♀. Cheliceres as in the male, but the second joint with five sharp and well-defined teeth, one on the anterior edge and four on the inner lateral edge; apophysis of fourth joint triangular with a few large spines on the inner edge and closely serrated on the outer; the fifth joint is much narrower than the fourth but the two fingers are the same as in the male. The third joint is much shorter and broader than the same one in the male and the whole cheliceres are shorter and stouter.

Cephalothorax exactly as in the male.

First abdominal segment entire, and rounded posteriorly as in the male.

The males and females of this species approach each other very closely in structure with regard to the cephalothorax and abdomen and the only point of distinction lies in the cheliceres.

This species is very abundant on Reef Island at the entrance of the Tavoy river in Tenasserim. It is a densely wooded island crowned by a small lighthouse. It is probably this species which Mons. Simon records from Tavoy and not *T. formosus*.

I have much pleasure in naming this species after Major C. T. Bingham, of the Forest Department of India, who has greatly assisted me in collecting these obscure animals.

9. *THELYPHONUS SAXATILIS*, n. sp.

♂. Cephalothorax, cheliceres, and abdomen black; first pair of legs reddish-black, except the tarsal joint, which, with the three other pairs of legs, is bright red; tail reddish-brown; below, the first joint of cheliceres black tinged with red; sternum and base of legs red; legs the same colour as the superior surface; abdomen reddish brown.

♀. Resembles the male in colour.

Immature animal. Cheliceres reddish-brown turning to pink on the last two joints; cephalothorax and abdomen dark olive-brown; first pair of legs olive, except the tarsal joint, which, with the three other pairs of legs, is pale red; below, uniform pale red, except the base of the cheliceres, which is reddish-brown.

Length 1.1 inch; cheliceres of male, .5.

Structure, ♂. Second joint of cheliceres punctured all over, the exterior-front corner wrinkled, the anterior and lateral edges with a few obsolete teeth, varying in number, one spine below; third joint punctured on the upper surface, granulated on the inner, and one blunt spine below; fourth joint nearly smooth, merely with a very few punctures, no spine below, apophysis long and cylindrical, constricted in the middle, rather swollen at the end with a tumid process on the inner side near the tip (Fig. 9); fifth joint large, nearly entirely smooth, fixed finger short and triangular, serrated on the outer edge, nearly smooth on the inner; movable finger rather long, curved throughout, the inner edge festooned and serrated.

Cephalothorax densely granulated, the space between the lateral and frontal eyes rather swollen.

First lower abdominal segment entire, rounded posteriorly.

Structure, ♀. Cheliceres much shorter than in the male but similarly punctured, etc.; second joint with five sharp distinct teeth on the front and internal edges and two spines below; third joint with one long spine below; fourth joint with a spine below and a triangular apophysis with a few spines or teeth on the inner edge and densely serrated on the outer; fifth joint narrow and feeble, fixed finger triangular, serrated on both edges, movable finger curved, sharply pointed and serrated on the inner surface.

First lower abdominal segment entire, sharply protruding posteriorly in a blunt point.

This species is very common at Thayetmyo in Burma being found under stones and bricks and in mud walls. Mr. D. K. Macdonald of the Public Works Department collected large numbers of this animal for me at that place.

10. THELYPHONUS RANGUNENSIS, n. sp.

♂. Cephalothorax, cheliceres, and abdomen deep black; coxæ and femora of all the legs reddish brown, remainder of legs deep red; beneath, the cheliceres dark reddish-black; sternum and legs deep red; abdomen deep reddish-brown.

♀. Of precisely the same colour as the male.

Immature animal. Cheliceres deep reddish-brown turning to red at the tips; cephalothorax and abdomen nearly black; coxæ and femora of all the legs and the tibial joint of the first pair of legs deep olive-green, remainder of legs pale red.

Length 1 inch; cheliceres, '45 in the male, '35 in the female.

Structure, ♂. Second joint of cheliceres sparingly punctured, with a few obsolete teeth on the front and interior margins and two spines below, of which one is very large and one very small; the exterior upper corner wrinkled; third joint rather closely punctured on the upper and outer sides, granulated within, with one tooth below; fourth joint nearly smooth, very broad, no spine below, apophysis very long, cylindrical, and of nearly equal width throughout, slightly wider near the extreme tip; fifth joint large, nearly smooth, fixed finger triangular, serrated on both edges, movable finger curved, sharp-pointed, and serrated within.

Cephalothorax densely granulated all over, the space between the lateral and frontal eyes slightly prominent and obsoletely ridged.

First lower abdominal segment entire, with the margin posteriorly rounded.

Structure, ♀. Cheliceres short; second joint with two spines below and five sharp, distinct ones on the front and inner edges, sparingly punctured all over but not wrinkled; third joint sparingly punctured all over with a spine on the inner surface; fourth joint with a few punctures, a spine below, and a triangular apophysis with a few large teeth on the inner edge and serrated on the outer edge; fifth joint sparingly punctured and serrated on the inner edge, fixed finger triangular and serrated on both edges, movable finger short and curved and serrated within.

Cephalothorax as in the male.

First abdominal segment below sharply produced posteriorly, entire.

This species is very common in Rangoon and the whole district round, being found under old timber, stones, and bricks.

11. THELYPHONUS SYLVATICUS, n. sp.

♂. Cheliceres pitchy black; cephalothorax and abdomen dull

black; first pair of legs and the coxæ and femora of the other legs very dark red, remainder of the legs bright red.

♀. The adult female is unknown, but will, without doubt, be found to have the same coloration as the male in respect to the legs.

Immature animal. Cheliceres pinkish brown; cephalothorax and abdomen dull blackish; coxæ and femora of all the legs deep olive, the other parts of the legs pale rufous.

Length .9 inch; cheliceres, .4 inch.

Structure, ♂. Cheliceres very slightly punctured, nearly smooth; second joint wrinkled on the exterior front corner with a few obsolete teeth on the front and interior edges, varying in number, one spine below; third joint without any spine; fourth joint broad with no distinct spine below, apophysis long, the first half very narrow and cylindrical, suddenly widening out to double the width on the terminal third; a tumid process on the interior surface near the tip; fifth joint fairly large, greatly sinuated on the interior edge, fixed finger triangular, smooth on the inner edge, serrated on the outer; movable finger sharply curved, and pointed, serrated on the inner edge.

The cephalothorax is densely granulated and the first abdominal segment entire and rounded posteriorly.

This species which is remarkable for the colour of its legs is no doubt common in the Tharrawaddy District of Burma, but I only procured an adult male and an immature animal of it, the former at Zigon, and the latter at Minhla. They were found in forest.

EXPLANATION OF PLATE II.

- Fig. 1. Apophysis of the fourth joint of the cheliceres of *T. indicus* ♂.
 " 2. " " " " " " " " *T. indicus* ♀.
 " 3. First lower abdominal segment of *T. indicus* ♂.
 " 4. " " " " " " " " *T. indicus* ♀.
 " 5. Terminal joint of cheliceres of *T. indicus* ♂.
 " 6. " " " " " " " " *T. indicus* ♀.
 " 7. Apophysis of the fourth joint of the cheliceres of *T. insularis* ♂.
 " 8. " " " " " " " " *T. insularis* ♀.
 " 9. " " " " " " " " *T. sazatalis* ♂.
 " 10. " " " " " " " " *T. wood-masoni* ♂.
 " 11. Terminal joint of cheliceres of *T. johorensis* ♂.
 " 12. Apophysis of the fourth joint of the cheliceres of *T. andersoni* ♂.
 " 13. " " " " " " " " *T. assamensis* ♂.